

A new species of *Calliostoma* (Gastropoda: Trochoidea: Calliostomatidae) from Tahiti

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ABSTRACT. *Calliostoma gavaldoni* n. sp., a new species from Tahiti is described and compared with similar species from the Pacific.

RESUME. Une nouvelle espèce de Calliostomatidae provenant de Tahiti, *Calliostoma gavaldoni* n. sp., est décrite et comparée avec d'autres espèces similaires du Pacifique.

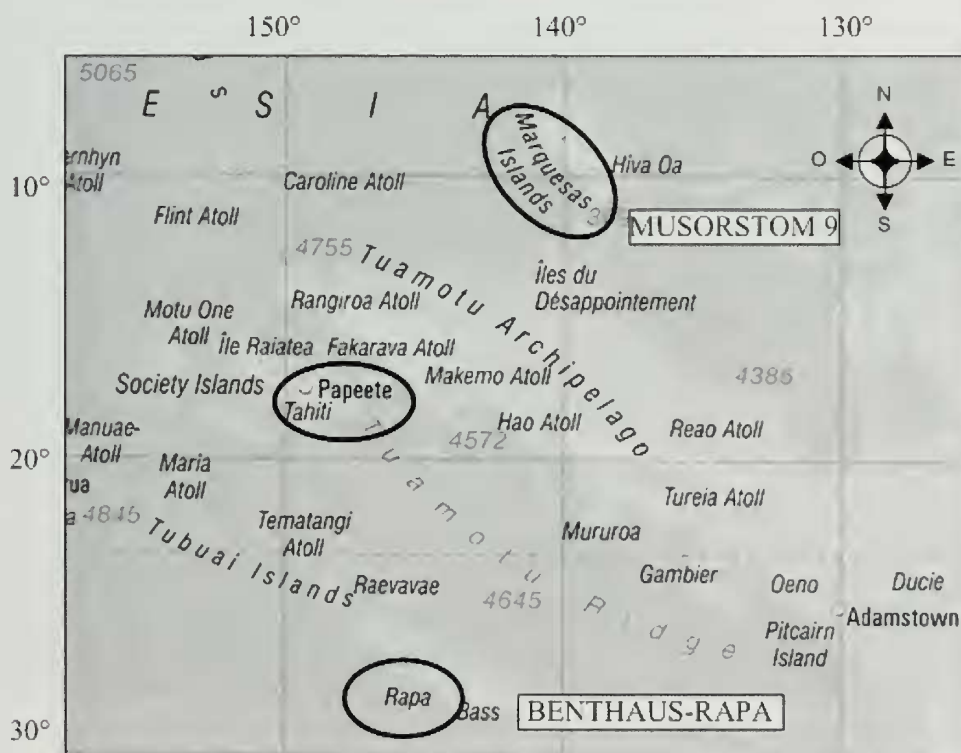
INTRODUCTION

French Polynesia is made up of five groups of islands of eastern Pacific : the Society Islands (divided in Windward Islands and Leeward Islands), the Marquesas Islands, the Austral Islands, the Tuamotu Islands and the Gambier Islands.

These are volcanic islands, with height that can reach about 1000 meters, all being old volcanoes uprising from ocean ground. This means that there is no shallow shelf : the depth between these islands is quickly of about a few hundred, sometimes one to three thousands meters. Most of these "high" islands are surrounded by a coral barrier at one or two

hundred meter from the shore. Between this barrier and the shore can be found a lagoon up to 30 m deep with coral reefs inside ("patates" in French).

The Society Islands make therefore an area characterized by shallow water all around the islands and lagoons, isolated from other archipelagos and islands groups by fairly deep waters. Dominant winds come from east, giving a choppy sea along the eastern coasts. Seaweeds do not make large fields, but only small, low carpets on some sandy bottoms in the lagoons or on the reefs.



Map 1 : Collecting area and adjacent islands groups of French Polynesia (with IRD-MNH campaigns).

The malacofauna of the Society Islands, is still rather poorly known, and this is the same for the whole Polynesia area. The only well known reference is the books of Salvat & Rives (1975, 1990).

Compiling various papers upon eastern Pacific, one can see that the Trochoidea are not very numerous in this area. For example, the French expeditions MUSORSTOM 9 (conducted in 8-9/ 1997 in the adjacent area of Marquesas Islands) and BENTHAUS (conducted in 10-11/2002 in the Austral Islands – especially the RAPA mission at the Rapa Island, the most southern of these islands), both initiated by the IRD (Institut de Recherche pour le Développement, Paris - ex-ORSTOM) and the MNHN (Muséum national d'Histoire naturelle, Paris) brought only a few of them. Especially, no Calliostomatidae species was ever reported from Society Islands ("*Calliostoma marmoreum*" Pease, 1868, figured by Kaicher (1979), is indeed *Cantharidus marmoreus* (Pease, 1868)).

Because the valuable work of Salvat and Rives is now a bit old, a dynamic team of conchologists has

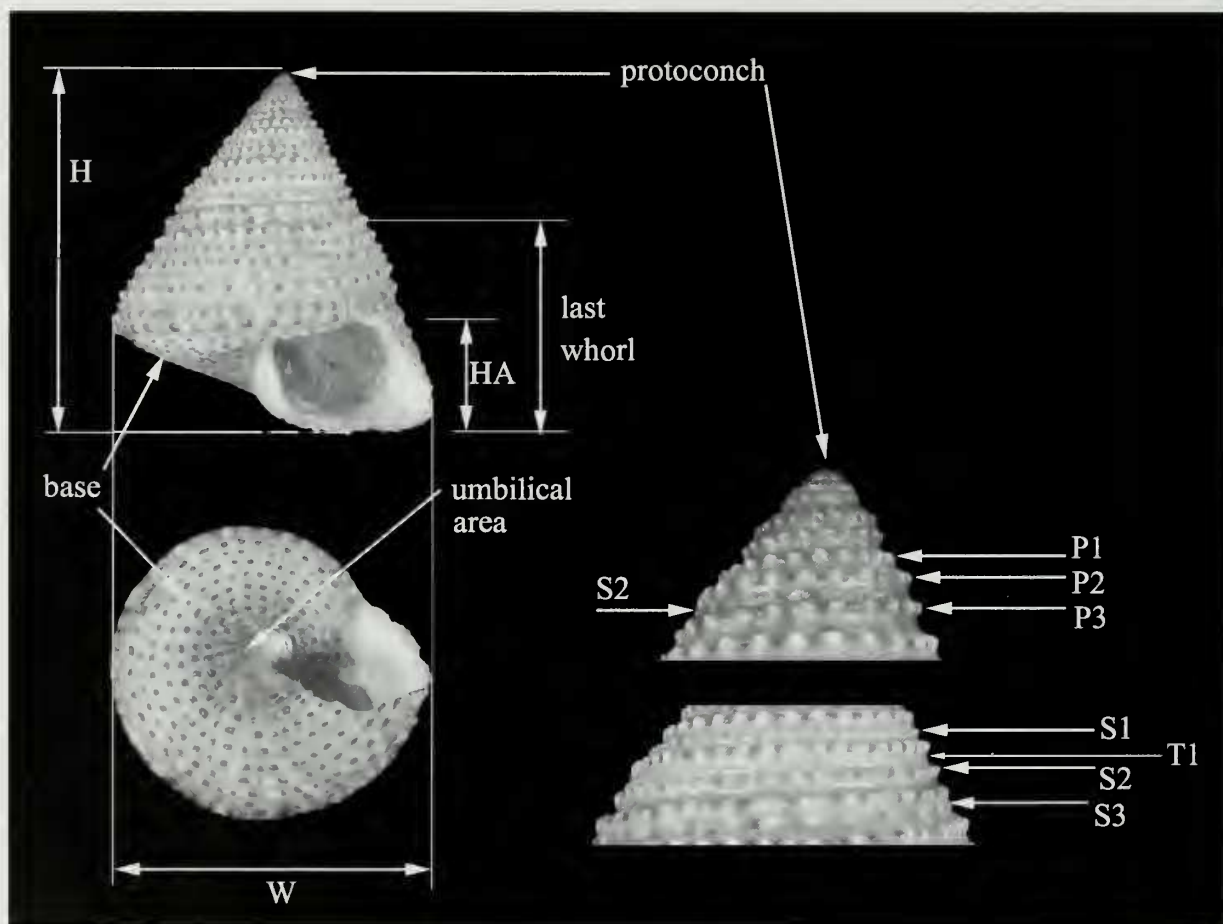
undertaken to write a new survey of this malacofauna. Among others, one of them, R. Gourguet, has handled old and new material from the area. Gourguet's team failed to find any species of Calliostomatidae, except a single specimen, found by a member of the group. After accurate study, it appears that this is a new species that is described in the present paper.

Material and methods

The material studied was found living by divers at the north-east of Tahiti Island (Society Archipelago) near Papeete, behind the reef barrier, under dead corals covered by low seaweed.

Regarding the description methodology, the main conchological features used are (see text figure 1 below) :

- ◆ general shape of the shell;
- ◆ shape of the whorls;
- ◆ spiral cords of the whorls;
- ◆ spiral cords on the base;
- ◆ shape of the aperture, the outer and the inner lip.



Text figure 1 : Features of Calliostomatidae shells; H : height; W : width; HA : height of the aperture; P1, P2, P3, ... : primary cords; S1, S2, S3, ... : secondary cords; T1, ... : tertiary cords (shell : *Calliostoma annulatum* (Lightfoot, 1786), Avila beach, California, U.S.A., 20.3 x 17.7 mm).

Abbreviations**Repository**

MNHN : Muséum national d'Histoire naturelle, Paris, France.

Other abbreviations

P1, P2, P3,: primary cords (P1 is the most adapical)

S1, S2, S3,: secondary cords (S1 is the most adapical)

T1, T2, T3,: tertiary cords (numbered following appearing order)

lv : live-taken specimens present in sample

SYSTEMATICS

I follow here the classification of Bouchet & Rocroi (2005), where Calliostomatidae, earlier treated as a subfamily of Trochidae (Hickman & McLean, 1990), are now ranked as a family of superfamily Trochoidea (besides true Trochidae and Solariellidae), with the two subfamilies Calliostomatinae and Thysanodontinae. Regarding subgenera of the genus *Calliostoma*, I refer to Marshall (1995).

Superfamily **TROCHOIDEA** Rafinesque, 1815

Family **CALLIOSTOMATIDAE** Thiele, 1924

Subfamily **CALLIOSTOMATINAE** Thiele, 1924

Tribe **Calliostomatini** Thiele, 1924

Genus *Calliostoma* Swainson, 1840

Type species : *Trochus comulus* Linnaeus, 1758 (by s.d. Herrmannsen, 1846) – Recent, Mediterranean Sea.

Subgenus : *Ampullotrochus* Monterosato, 1890

Type species : *Trochus granulatus* Born, 1778 (by monotypy) – Recent, Europe.

Calliostoma (Ampullotrochus) gavaldoni

Figs 1-3

Type material. Holotype (6.6 x 5.4 mm) MNHN (22000).

Type locality. Tahiti, Arue, behind barrier reef at lagoon side, 17°31'S, 149°31'W, 1 m.

Material examined. Tahiti. Arue, 17°31'S, 149°31'W, 1 m, 1 lv (holotype).

Distribution. Only known from the type locality.

Diagnosis. A typical small *Calliostoma* species with a moderately elevated, conical spire, 6 major spiral cords with a strong, prominent, granular, with blunt pointed beads, abapical spiral cord making keel, an almost flat base with 17 granular spiral cords, without umbilicus.

Description. *Shell* of small size for the genus (height 6.6 mm, width 5.4 mm), higher than wide, conical in

shape: spire moderately elevated, height 1.2x width, 4.7x aperture height; subangulate periphery; anomphalous.

Protoconch about 200 µm wide, of 1 whorl, rounded, with a network of strong, largely spaced ridges giving reticulate shape; apical fold more or less straight, with a rather thin, poorly marked, rounded terminal varix.

Teleoconch of 6.2 whorls; all whorls straight, with a peripheral sharp spiral cord.

Suture hard to detect, not canaliculated.

First whorl convex, sculptured by axial, weakly prosocline threads and 3 spiral cords P1, P2 and P3 appearing immediately, granular by intersection with axial threads; P2 and P3 strong, similar in size, P1 much weaker; distance between threads 1.5x larger than threads. On second whorl, P3 strongest with big sharp nodules, P1 weakest; axial threads twice thicker than on first whorl, flattened, distance between still 1.5x larger than threads. On third whorl, S3 appearing, rather thin; S2 commencing at end of whorl, very thin; axial threads obsolete except between P3 and S3 where they are very thick and rounded. On fourth whorl, S3 as strong as P2, with pointed beads; S1 commencing at mid whorl, very thin; secondary axial threads appearing between strong primary threads in area between P3 and S3, making by intersection on S3 small pointed beads between each pair of big sharp beads. On fifth whorl, axial threads between P3 and S3 all similar in size; beads of S3 more regular, more or less similar in size. On last whorl, S1 and S2 slightly weaker than P1 and P2; P3 strongest with very sharp beads; S3 slightly weaker, with closely packed, blunt pointed beads, about 1.5x to 2x smaller than beads of P3; tertiary cord T1 appearing between P2 and S2; P4 absent; axial threads obsolete.

Aperture elliptical; outer lip moderately thick, producing a weak obtuse angle at meeting point with inner lip.

Columella nearly straight, weakly oblique, without tooth; callus completely covering umbilicus.

Base almost flat, with 17 granular cords; inner cords slightly stronger than outer ones; interspace between cords smaller than cords; thin axial threads visible between inner cords.

Colour of teleoconch beige with brown dots on S3 and white spots on P3; protoconch beige.

Operculum unknown (animal dried and damaged).

Discussion. The placement of the new species in *Ampullotrochus* subgenus is justified by the more or less angulate periphery, the flat whorls and the late persistent axial sculpture (at least in the abapical part). The single specimen of *Calliostoma (Ampullotrochus) gavaldoni* n. sp. shows very distinctive characteristics, although additional material would be highly useful. It may be compared to *C. (A.) xanthos* Marshall, 1995 (Figs 6–7) from southern New Caledonia, Loyalty Island and Kermadec Islands, especially subadult specimens, but this larger species has a P1 commencing later, S3 and P4 similar in size with

similar in size beads and a very more angulate periphery.

The new species is also rather close to *C. (A.) alisi* Marshall, 1995 (Figs 4–5) from Loyalty Islands, but this larger species has a S3 stronger than P3, rounded axial threads on the whole surface, a more angulate periphery and only 10 or 11 spiral cords on the base.

Considering the prominent P3 cord and the subangulate periphery, the new species also weakly reminds *C. (Fautor) periglyptum* Marshall, 1995 (Figs 8–9) from southern New Caledonia and Loyalty Islands, but this slightly larger species has a different secondary cords ontogeny, with S2 appearing first and S3 appearing the last or even absent.

Calliostoma (Ampullotrochus) gavaldoni n. sp. has a secondary cords ontogeny similar to *C. sanjaimense* Mc Lean, 1970 (Figs 10–11) from tropical north-eastern Pacific, but this much larger species has a S3 cord with beads appearing simultaneously (not in two times), stronger spiral cords on the base with larger distance between cords.

Etymology. After Tony Gavaldon, experienced conchologist from Tahiti area, field collector respectful of environment and nature lover, who drew his friends collectors attention to the here described specimen.

ACKNOWLEDGEMENTS

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Figures 1-11

Scale bar: 1 mm.

1-3. *Calliostoma (Ampullotrochus) gavaldoni* n. sp., holotype MNHN (22000), Tahiti, 1 m, 6.6 x 5.4 mm.

Scale bar: 5 mm.

4-5. *C. (A.) alisi* Marshall, 1995, holotype MNHN, Loyalty Islands, 430 m [MUSORSTOM 6, stn CP464], 14.4 x 12.5 mm; **6-7.** *C. (A.) xanthos* Marshall, 1995, MNHN, Norfolk Ridge, 400-402 m [BATHUS 3, stn DW838], 10.5 x 9.6 mm; **8-9.** *C. (Fautor) periglyptum* Marshall, 1995, MNHN, southern New Caledonia, [BERYX 11, stn DW18], 9.1 x 7.1 mm; **10-11.** *C. sanjaimense* Mc Lean, 1970, Coco Island, 6 m, C.Vilvens coll., 11.2 x 9.9 mm.

